

Claims

- [c1] 1. A color display system, comprising:
an illumination system that provides fixed, color-separated illumination of color-component sub-pixels in a pixellated electronic display panel; and
a post-display panel dynamic displacement element that displaces alignment of the color-component sub-pixels generated by the display panel.
- [c2] 2. The system of claim 1 further comprising an angular color separation system with plural angularly inclined dichroic mirrors for providing the color separation of incident multi-color illumination light.
- [c3] 3. The system of claim 1 further comprising a microlens array positioned adjacent the pixellated electronic display.
- [c4] 4. The system of claim 3 further comprising a grating positioned between the microlens array and the pixellated electronic display.
- [c5] 5. The system of claim 4 in which the grating includes a holographic optical element.
- [c6] 6. The system of claim 1 further comprising a grating for providing the color separation of incident multi-color illumination light.
- [c7] 7. The system of claim 6 in which the grating includes a holographic optical element.
- [c8] 8. The system of claim 1 in which the dynamic displacement element includes a rotating element that successively directs the color-component sub-pixels generated by the display panel along different optical paths.
-
- Sub
a' [c9] 9. The system of claim 1 in which the rotating element includes a birefringent element with a selected polarization direction.
- [c10] 10. The system of claim 1 in which the rotating element includes a plural refractive segments having different inclination orientations.
- [c11] 11. The system of claim 1 in which the dynamic displacement element

Q1
End

includes a pair of face-to-face refractive elements with a separation between them that is modified to successively direct the color-component sub-pixels generated by the display panel along different optical paths.

- [c12] 12. The system of claim 11 in which each of the refractive elements includes a prism array.
- [c13] 13. The system of claim 1 further comprising a color separating element for providing the color separation of incident multi-color illumination light and a prism array positioned after the color separating element.
- [c14] 14. The system of claim 13 in which the color separating element includes an angular color separation system with plural angularly inclined dichroic mirrors.
- [c15] 15. The system of claim 1 in which the display panel includes color-component sub-pixels that are arranged in vertical columns for each color component.
- [c16] 16. The system of claim 1 further comprising a microlens array positioned adjacent the display panel, wherein the each microlens is aligned with and delivers light to a triplet of color-component sub-pixels that are arranged in a horizontal row.
- [c17] 17. The system of claim 16 in which the display panel includes color-component sub-pixels that are arranged in vertical columns for each color component and successive sub-pixels in each column are positioned in alternate successive rows.

Sub
Q2

- [c18] 18. The system of claim 1 in which the display panel includes color-component sub-pixels that are arranged in vertical columns for each color component and the system further comprises a microlens array positioned adjacent the display panel, wherein the each microlens is aligned with and delivers light to a triplet of color-component sub-pixels that are arranged that are positioned among two adjacent horizontal rows.

Ad
End

[c19] 19. A color electronic display projector, comprising:
an illumination system that provides fixed, color-separated illumination of
color-component sub-pixels in a pixellated electronic display panel; and
a post-display panel dynamic displacement element that displaces alignment
of the color-component sub-pixels generated by the display panel.

[c20] 20. The projector of claim 19 further comprising an angular color separation
system with plural angularly inclined dichroic mirrors for providing the color
separation of incident multi-color illumination light.

[c21] 21. The projector of claim 19 further comprising a microlens array
positioned adjacent the pixellated electronic display.

[c22] 22. The projector of claim 21 further comprising a grating positioned
between the microlens array and the pixellated electronic display.

[c23] 23. The projector of claim 22 in which the grating includes a holographic
optical element.

[c24] 24. The projector of claim 19 further comprising a grating for providing the
color separation of incident multi-color illumination light.

[c25] 25. The projector of claim 24 in which the grating includes a holographic
optical element.

[c26] 26. The projector of claim 19 in which the dynamic displacement element
includes a rotating element that successively directs the color-component
sub-pixels generated by the display panel along different optical paths.

Sub
a3

[c27] 27. The projector of claim 19 in which the rotating element includes a
birefringent element with a selected polarization direction.

[c28] 28. The projector of claim 19 in which the rotating element includes a plural
refractive segments having different inclination orientations.

[c29] 29. The projector of claim 19 in which the dynamic displacement element
includes a pair of face-to-face refractive elements with a separation between

a3
End

them that is modified to successively direct the color-component sub-pixels generated by the display panel along different optical paths.

- [c30] 30. The projector of claim 29 in which each of the refractive elements includes a prism array.
- [c31] 31. The projector of claim 19 further comprising a color separating element for providing the color separation of incident multi-color illumination light and a prism array positioned after the color separating element.
- [c32] 32. The projector of claim 31 in which the color separating element includes an angular color separation system with plural angularly inclined dichroic mirrors.

Sub
a4

- [c33] 33. A color display method, comprising:
illuminating color-component sub-pixels in a pixellated electronic display panel with color-separated, fixed color components; and
dynamically aligning the color-component sub-pixels after the display element.
- [c34] 34. The method of claim 33 further comprising an angularly color separating incident multi-color illumination light to provide the color-separated color components.

- [c35] 35. The method of claim 33 in which dynamically aligning the color-component sub-pixels includes successively directing the color-component sub-pixels generated by the display panel along different optical paths.

Sub
a5

- [c36] 36. The method of claim 35 further comprising successively directing the color-component sub-pixels through different segments of a rotating light displacement element.
- [c37] 37. The method of claim 33 in which the display panel includes color-component sub-pixels that are arranged in vertical columns for each color component and dynamically aligning the color-component sub-pixels after the display element includes displacing selected color components laterally.

38. The method of claim 33 in which the color-component sub-pixels of a pixel are arranged on the display panel in adjacent rows and dynamically aligning the color-component sub-pixels after the display element includes displacing selected color components in transverse directions.

39. In a color display system with plural pixellated electronic display panels that each receive illumination of a different color component of light and a combiner that combines color component light images formed by the display panels, the improvement comprising:
a post-combiner dynamic displacement element that displaces alignment of the color-component sub-pixels generated by the display panel to form a resolution-enhanced display image.

(a) With the same graph of f as in Fig. 1, the graph of f is shown in Fig. 2. The graph of f is shown in Fig. 2. The graph of f is shown in Fig. 2.